



Installation & Calibration



ED2-2X-SM Series SkidWeigh System

Lift Truck On-board Check Weighing
With Two Independent Weighing Channels & Visual Overload Warning

ED2-2X-SM Series SkidWeigh V.1.1



General Installation Guide

This **ED2-2X-SM Series SkidWeigh** system installation & calibration guide describes how to install, calibrate, test and use your on-board check weighing unit. Following the instructions in this guide will enable you to get your system operating quickly and easily. In the event that you require additional assistance, please contact customer support via e-mail at support@skidweigh.com or visit www.skidweigh.com or contact us at the address or contact number below:

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Safety

Always disconnect the vehicle battery while installing SkidWeigh system or any other electronic product.

Make sure sure that unit, pressure transducer and any other associated cables are securely mounted and do not impede any of the vehicle's controls. Use care when routing the components cables. Route the cables where they will be protected. Use commonly accepted install practices for after market industrial vehicle electronic devices.

The installation of the SkidWeigh systems should only be performed by an acknowledged lift truck dealer technician or end user electro and hydraulic technical installer.

Here are two acceptable methods of making a wire connections:

- * Soldering your connections (recommended)
- * Crimp connectors (with the use of the proper crimping tool)

Regardless of the method you choose, ensure that the connection is mechanically sound and properly insulated. Use high quality electrical tape and shrink tubing where necessary.

This product is connected directly to the vehicle's ignition switch, 12 to 55 V DC. There is no on-off switch on the unit.

Electro-Magnetic Compatibility

CE conformity to EC directive 89/336 (EMC) by application of harmonized standards: Interference stability EN 61000-6-2 and EN 61326-1 interference emit EN 61000-6-3, EN 61326-1 for the pressure transducer.

ED2 SkidWeigh Series

Our policy is one of continuous improvement and the information in this document is subject to change without notice. Check that software version displayed on LED is the one applicable for your application.

Overview of components

The standard **ED2-2X SkidWeigh** check weighing system consist of two main components:

- * Digital indicator with wiring harness, mounting bracket and anti-vibration mount
- * Hydraulic pressure transducer with 3 wires cable
- * Installation & Calibration manual and operator usage instruction



Operational principal

The **ED2-2X-SM Series SkidWeigh** system operational principal is based on the hydraulic pressure transducer mounted in the vehicle lifting hydraulic circuit that will automatically activate the “weighing cycle / specific algorithm ” every time a skid load is lifted just above the ground. The increase in pressure is converted in an electronic signal at the sample rate of 16000 readings which is converted into a load weight reading.

Pressure transducer installation

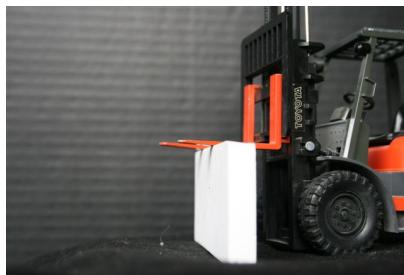
The pressure transducer must be installed in the lifting hydraulic line ***between the lift control valve and lift cylinder(s).*** Mount a T-piece in lifting hydraulic line. In some cases you can install the pressure transducer in the flow divider, drilling and tapping for 1/4"-18 NPT male in spare plug (if only single or double mast configuration) or in the body of the flow divider. Also, you can drill and tap on any “larger elbow” that might be available in the hydraulic lifting circuit found in vehicles with larger hoses to accommodate larger vehicle lifting capacities.

Pressure transducer installation precautions

Before installation of the pressure transducer the hydraulic lift circuit must be pressure free.

There are two ways to do that:

1. Place the forks on the ground in their lowest position and make the hydraulic system pressure free by tilting the mast forward. The chain(s) should be slack.
2. Lift the forks and position them on the top of a supporting fixture. Start lowering the lifting cylinder into its lowest position. Be sure that chain(s) are slack.



Make sure that the installed pressure transducer will not touch any moving parts or assembly of the vehicle while in normal operation. Pressure transducer has 1/4"-18 NPT male thread. Use thread seal to ensure tight fit.

Selecting the mounting location for digital indicator

Use the mounting bracket with the anti vibration mount and fasten digital indicator on the vehicle dashboard or side railing preferably on the right hand side. There are many examples of mounting locations that will depend on the vehicle model. However, additional mounting items such as a flat brackets may be needed to help secure the unit to upper right corner of the guard or side railing.



Choose the correct location and make sure that:

- Indicator is visible and within reach of the operator
- Location so that operator does not hit a head

Compact size

All of the SkidWeigh systems are compact size, housing dimension of only 120 x 80 x 55 mm.

Electrical Connections

All SkidWeigh systems operate from 12 to 55 V DC.

Digital indicator with seven wires single cable

- **Orange Wire (+) Ignition switch On position**
- **Brown Wire (-) Battery negative**
- **Red Wire, connect to RED wire of the pressure transducer cable**
- **Black Wire, connect to BLACK wire of the pressure transducer cable**
- **White Wire, connect to WHITE wire of the pressure transducer cable**

Pressure transducer cable

Pressure transducer cable must be connected to the digital indicator seven wires single cable

- **White Wire, signal 0 to 2,5 V**
- **Black Wire, signal negative**
- **Red Wire, power supply to pressure transducer + 11 V DC**

Electrical power short circuit protection

- All of the SkidWeigh systems are internally short circuit protected with resettable fuse. There is no need to install external inline fuse in orange wire connected to the ignition switch.
- Automotive 60 V load dump protection
- Reversal power supply protection
- **Note:** Any external devices connected to the SkidWeigh system, such as non standard onboard printer might require external fuse.



“Quick test to determine if electrical connections are done right”



Note: SkidWeigh weighing calibration function is not done yet at this stage. This procedure is only to test if electrical connections of the system installation into the vehicle is done properly!

After you have connected electrical power and pressure transducer cable you can “quickly” check the system operation. - Lower the forks to the ground

- Turn On ignition switch
- Digital LED display will be activated, showing software version and serial number
- Number **8** will be shown on LED display above the **Mode** sign.

- Go ahead and lift the forks and engaged second mast to

increase pressure in lifting cylinder. Number **8** will go off and some load weight will be shown on LED display.

If the above test is valid than the system electrical connections are done right. The next procedure will be to calibrate the SkidWeigh weighing function.

Lift truck equipped with hydraulic accumulator

If the standard SkidWeigh system is installed on the lift trucks equipped with hydraulic accumulators, please contact us to provide you with different digital indicator having specific software algorithm to obtain load weight accuracy within +/- 0.1 to 1% of vehicle maximum lifting capacity.



Weighing function calibration procedure

The **ED2-2X-SM Series SkidWeigh** calibration is automatic and is done by lifting empty and loaded forks (or any other attachment such as paper clamp) just above the ground. **MAKE SURE THAT YOU HAVE A KNOWN LOAD WEIGHT AND KEEP IT NEARBY TO COMPLETE THE CALIBRATION.**

For the best results use at least minimum calibration load test weight of 30 to 50% of maximum lifting capacity of the lift truck. Use customer floor scale or find a known skid load weight within the operational facility.



Important: If you want the system to show load weight in pounds, use the known load weight in pounds and enter that value accordingly. The same would apply if you want the system to show load weight in kilograms. Use the known load weight in kilograms and enter that value into the system accordingly.

Digital Indicator (Calibration and two keys description)

- Upper right button “**M**” is used to enter calibration mode and to shift left to the next digit.
- Lower right button “**Arrow Up**” is used to enter numerical increments from 1-9, wrap around.
- Both buttons are used during the system calibration.
- Buttons can be accessed through two small holes on the cover.
- Use paper clip to activate buttons. Do not push buttons too hard!
- Left most significant digit represents **Mode of operation**.
- Other five digits represent the load weight readout.



Mode LED Digit

Five Digits Load Weight Display

MODE	Digit 5	Digit 4	Digit 3	Digit 2	Digit 1

- Note:

- Every time the power is applied the software version will be shown momentarily for a brief moment.
- When forks are lowered to ground LED display will show **Mode 8**. This is a starting point to take load weights.
- For best results during weight calibration use at least 30 to 50 % of known load weight of the vehicle lifting capacity.
- If you make a mistake during the system calibration, turn power ON / OFF and start all over.
- If the power to the system is disconnected calibration information / set up information **will not be lost**.



Calibration ED2-2X-SM SkidWeigh Series (Mode 8, Weighing Channel One)

EXAMPLE: Standard Forks

Lower the empty forks to the ground. There should be no hydraulic pressure in lift hydraulic circuit.

- Turn ignition switch to on position (electric lift trucks) and start the engine on combustion powered lift trucks
- LED display will show software version briefly on the right side and number **8 or 82** will be shown in the **Mode** digit.
- Press two position button and make sure that **Mode 8** is shown on LED display. This is the **weighing channel one**.



1. Weighing Channel One: Calibration of empty forks lifted just above the ground

To initiate calibration press the “**M**” key (use a paper clip) and hold it down for approx. 5 seconds.



After 5 seconds the Mode display digit will change from number **8** to **0**.

System is ready for automatic zeroing of the scale function

When LED display is showing “**0**” in **Mode** digit, lift the empty forks (or attachment such as longer forks, clamp, etc) **just above the ground**.

Note: *Activate the lift control valve as you would do during the normal lifting operation. Do not lift the empty forks slowly.*

Wait few seconds, LED display will go blank and will show **Mode digit 1** and default “**0**” value in furthest right digit display.

*(The “**0**” value in furthest right digit might be some other number if calibration done previously with different load weight)*



Automatic zeroing is done !

2. Calibration of loaded forks lifted just above the ground

At this point drive your vehicle into the skid load with known weight and lower the **loaded forks to the ground**.

(In this example the known load weight is 4000 kg)



- Start entering a known load weight into digital indicator by using **arrow up button** (increments from 0 to 9) with wrap around function. Start with least significant digit of your known load weight.
- Use the **“M”** button to increment to next digit on the LED display.

First least significant digit “0”	Second least significant digit “0”	Third least significant digit “0”	Forth least significant digit “4”	Must enter “0”
				

- Repeat this procedure until the **Mode** digit display is showing number **4**.

Caution: In our example a known load weight value of 4000 kg consist only of four digits. Make sure that the 5th digit has “0” value entered into the calibration system. (504000)



- With forks on the ground press “**M**” button to advance to Mode “**6**” and lift loaded forks just above the ground.



Within few seconds display will show the value of the known load weight.



If you lower the loaded forks to the ground the **Mode** digit will display number **8**. System is ready to be used.

ED2-2X-SM Series SkidWeigh Systems Weight Calibration Function For Weighing Channel One Is Done (Mode 8)



Overload Warning Input Value Procedure (ED2-2X-SM)

- In order to input the overload value into the system you **must lower the loaded forks to the ground**.
- The **Mode number 8** will automatically advance to the **Mode 7**.

Using the **“M”** and **“Up Arrow”** keys enter the overload weight value for your application. The **Mode 7** digit remains throughout this operation. On the last shift utilizing **“M”** key the **Mode 7** digit will turn off. The overload weight value will be successfully stored in the system memory.

- **Note:** If the overload input value is as of the example **4850**, **having only 4 digits** make sure that 5th digit is **0**.

Mode	Digit 5	Digit 4	Digit 3	Digit 2	Digit 1
7	0	4	8	5	0

ED2-2X-SM Series SkidWeigh Systems

Weight Calibration And Overload Warning Function Is Done (Channel1)
Calibration ED2-2X SkidWeigh Series (Mode 82, Weighing Channel Two)

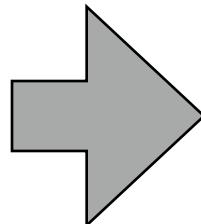
EXAMPLE: Paper Clamp or Different Size Of Forks

Lower the empty forks (**with longer forks, or clamp etc.**) to the ground. There should be no hydraulic pressure in lift hydraulic circuit.

- Turn ignition switch to on position (electric lift trucks) and start the engine on combustion powered lift trucks
- Press two position button and make sure that **Mode 82** is shown on LED display. This is a **weighing channel two**.



Weighing Channel One



Weighing Channel Two

With LED display showing **Mode 82** follow the same calibrating procedure as for weighing channel one (**Mode 8**



User's Manual

Lift truck operator copy

Standard Weighing Procedure (*Weighing Channel one, Mode 8*)

Push two position button until LED display shows **Mode 8**.

- Insert the forks into the pallet load. Lower the forks to the ground. With no hydraulic pressure in lifting line the **Mode LED display will show number 8**.



System is ready to weigh product on the forks.

- Activate the lift control lever and lift the load just above the ground.
- As soon as the load is lifted, digital display will go “blank” for a moment and the load weight will be shown on the LED display.



Note: To initiate the “**Weighing Cycle**” the LED indicator must show **Mode 8**. If LED display shows any other number, lower the forks to the ground. Always activate lift control valve lever “quickly” and lift the load weight just above the ground. Do not attempt to lift the load slowly!

Check weighing accuracy is within +/- 0.1 to 1% of lift truck maximum lifting capacity.



Standard Weighing Procedure (*Weighing Channel Two, Mode 82*)

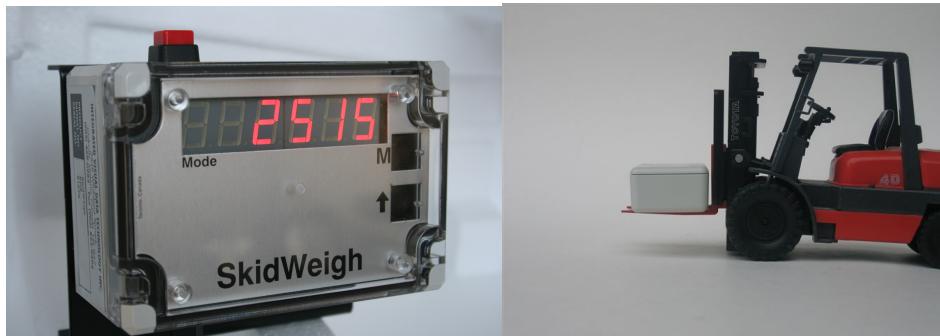
Push two position button until LED display shows **Mode 82**.

- Insert the forks into the pallet load. Lower the forks to the ground. With no hydraulic pressure in lifting line the **Mode LED display will show number 82**.



System is ready to weigh product on the forks.

- Activate the lift control lever and lift the load just above the ground.
- As soon as the load is lifted, digital display will go “blank” for a moment and the load weight will be shown on the LED display.



Note: To initiate the “**Weighing Cycle**” the LED indicator must show **Mode 82**. If LED display shows any other number, lower the forks to the ground. Always activate lift control valve lever “quickly” and lift the load weight just above the ground. Do not attempt to lift the load slowly!

Check weighing accuracy is within +/- 0.1 to 1% of lift truck maximum lifting capacity.